

BRIEF DESCRIPTION OF DRAWING

FIG. 1 shows a top view of a cathode ray tube funnel according to the present device.

FIG. 2 shows a cross sectional view on an A-A line of
5 the cathode ray tube funnel according to the present device.

FIG. 3 shows a rear view of the cathode ray tube funnel according to the present device.

FIG. 4 shows a cross sectional view of a combination of a funnel female forming mold and a funnel male forming mold.

10 FIG. 5 is a rough diagrammatic drawing of a funnel and neck connecting device.

FIG. 6 shows a view such that a cathode ray tube funnel by the use of the funnel of the present device is mounted in a cabinet.

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DETAILED EXPLANATION OF THE DEVICE

The present device relates to a special constitution of a cathode ray tube funnel. Particularly, the present device relates to a special constitution of a cathode ray tube funnel,
20 whereby a cathode ray tube is capable of being manufactured easily.

In the cathode ray tube, particularly, in a color image tube, an axis of a funnel portion and an axis of a neck portion are arranged on a line and it is required that they are not
25 bent each other and they are not deviated from the line each other with a very high degree of accuracy, so that this involves a problem such that it takes a very long time to adjust a position

of both axes upon manufacturing and a yield ratio is very bad.

The present device has been made taking the foregoing problems into consideration, an object of which is to provide a cathode ray tube funnel such that a positioning protrusion
5 is formed on at least three corner portions of a funnel outer periphery, respectively, planes made by rear surfaces of these protrusions are placed on the same plane, the said plane is substantially orthogonal to a funnel axis and the both axes of the funnel portion and the neck portion are easily identical
10 with each other upon connecting the funnel portion and the neck portion by making the plane into a reference plane.

Therefore, as shown in FIGS. 1 to 3, protrusions 2a, 2b, 2c and 2d are formed on, for example, respective corners on an outer periphery of a funnel portion 1, respectively. In
15 this case, rear surfaces 3a, 3b, 3c and 3d of these protrusions are placed on the same plane 4 and this plane 4 is substantially orthogonal to an axis 5 of the funnel portion 1. In this case, the rear surfaces 3a, 3b, 3c and 3d of these protrusions are placed forward as much as possible, however, respective outer
20 peripheries 6a, 6b, 6c and 6d may not protrude from the outer periphery of a front end face 1a of the funnel portion 1 and they are placed on the periphery thereof or they may be placed slightly on the inside thereof. Alternatively, these outer peripheries are substantially at equal distance from an axis
25 5 and further, these outer peripheries comprise a positioning surface upon connecting to the neck portion. Further, step portions 8a and 8b are formed in the vicinity of a pair of corners

7a and 7b, to which an inner surface of the funnel portion 1 is adjacent, and a step portion 8c is formed in a middle portion of other pair of corners 7c and 7d, respectively. These step portions 8a, 8b and 8c are placed on the same plane 9 and this
5 plane 9 may be orthogonal to the axis 5 substantially.

For example, as shown in FIG. 4, such a present funnel 1 forms fallen parts 11a, 11b, 11c and 11d on the corresponding positions of the protrusions 2a, 2b, 2c and 2d of the inner surface of a funnel female forming mold 10, respectively. A
10 plane 13 formed by front surfaces 12a, 12b, 12c and 12d of these fallen parts is orthogonal to an axis 14 of the funnel female forming mold 10. Alternatively, fallen parts 16a, 16b and 16c are formed on the corresponding positions of the step portions 8a, 8b and 8c of the outer surface of a funnel male forming
15 mold 15, respectively. As a result, it is possible to mold a cathode ray tube funnel easily by using these a female forming mold and a male forming mold so that a plane 18 formed by front surfaces 17a, 17b and 17c of the fallen parts 16a, 16b and 16c is orthogonal to an axis of the funnel male forming mold 15.

20 In order to connect the above described funnel portion according to the present device, for example, as shown in FIG. 5, the funnel portion 1 is supported on a first ring shaped supporting body 20 protruding from a supporting pole 19 by the rear surfaces 3a, 3b, 3c and 3d of the protrusions of the funnel
25 portion 1. Alternatively, in the same way, a neck portion 22 is supported on a second ring shaped supporting body 21 protruding from the supporting pole 19 under this supporting

body 20 in parallel with the supporting body 20. In this case, the axes of the first and the second ring shaped supporting bodies 20 and 21 are adjusted in advance so as to be on the same straight line, respectively, so that these axes, the axis
5 of the funnel portion 1 and the axis of the neck portion 22 are identical to each other. Alternatively, the first supporting body 20 is formed by, for example, a reference part 20a and a supporting body 20b, which is rotatably attached thereon. Further, a top surface 20c of this supporting body
10 20b is orthogonal to an axis of the supporting body 20b and it serves to receive the rear surfaces 3a, 3b, 3c and 3d of the protrusions. Alternatively, a plurality of protruding elements 23 are planted on this receiving surface 20c. Inner surfaces of these protruding elements 23 contact the outer
15 peripheries 6a, 6b, 6c and 6d for positioning the protrusions when the axis of the funnel portion 1 is identical with the axis of the supporting body 20, so that the positioning of the funnel portion 1 in all directions on the receiving surface 20c is provided. In the same way, the second ring shaped
20 supporting body 21 is formed by a reference part 21a and a supporting portion 21b attached thereon rotatably, for example, which is configured by a chuck constitution. Alternatively, the supporting portions 20b and 21b are engaged in pulleys 27 and 28, which are attached on a rotational shaft 26, respectively,
25 for example, by belts 24 and 25. The funnel portion 1 and the neck portion 22 are simultaneously rotated at the same time. Then, connecting portions funnel of the portion 1 and the neck

portion 22 are heated by a gas burner 29 so that both of them are connected.

As described above, according to the present funnel, upon connecting this and the neck, if the funnel 1 is attached to the supporting portion 20 by the rear surfaces 3a, 3b, 3c and 3d of the protrusions thereof, it is possible to obtain a cathode ray tube in which the funnel axis, the neck axis are automatically identical with each other and the axes of them are not bent each other and a tube axis becomes a straight line easily.

Further, it is possible to make the rear surfaces 3a, 3b, 3c and 3d of the protrusions of the funnel portion 1 into not only a reference surface upon connecting the neck portion but also an attaching reference surface with respect to a cabinet of the cathode ray tube. In other words, for example, as shown in FIG. 6, the connection portion of a panel portion 32 and the funnel portion 1 is fastened by a band body 33, this cathode ray tube 30 is arranged in the inside of a cabinet 34, a margin of a front surface 31 of the cathode ray tube 30 contacts an inner peripheral end 36a of a window 36, which is formed on a front plate 35 of the cabinet 34, oppositely, free ends of pressing attachments 37a, 37b, 37c and 37d are bent inwardly, respectively, of which the other ends are fixed to the inner surface of the front plate 35, the rear surfaces 3a, 3b, 3c and 3d of the protrusions of the funnel portion 1 are pressed forwardly by these bent edge portions 38a, 38b, 38c and 38d via the band body 33, respectively so as to hold the cathode ray tube 30 in the cabinet 34, so that a cathode ray tube 30

by the use of the funnel portion 1 according to the present device is clipped by a margin of a panel front surface 31 and the rear surfaces 3a, 3b, 3c and 3d of the protrusions in according to need. Accordingly, the rear surfaces 3a, 3b, 3c and 3d of the protrusions each forms a cabinet attaching reference surface as well as it acts as an engagement element. Alternatively, by attaching the engagement element to the band body 33, it is also possible to connect the band body 33 and a cabinet 34. Alternatively, upon using the band body 33, as described above, it is possible to act the protrusions 2a, 2b, 2c and 2d as the engagement element of this band body.

Further, upon forming the above described step portions 8a, 8b and 8c in the inner surface of the funnel portion 1, it is possible to make a plane 9 formed by these step portions into a reference plane upon measuring the curvature of the inner surface of the funnel. In this case, even if a front edge face 1a of the formed funnel portion 1 is slightly twisted, the deviation from a plane orthogonal to the funnel axis 5 becomes smaller than in the case when this edge face 1a is used as the reference plane, so that it is possible to measure the curvature more accurately. Alternatively, upon molding the funnel, it is possible to easily detect a defective unit depending on that the funnel male forming mold 15 is obliquely inserted in the funnel female forming mold 10 by measuring a distance d between the front edge face 1a of the molded funnel and the step portions 8a, 8b and 8c, respectively.

CLAIM OF UTILITY MODEL

A constitution of a cathode ray tube funnel, wherein a positioning protrusion is formed on at least three corner portions of a funnel outer periphery, respectively, a plane
5 made by rear surfaces of said protrusions are substantially orthogonal to a funnel axis and the said plane comprises a reference plane.

